Coral reefs of the Mozambique Channel a leading candidate for saving marine diversity

April 10 2014

A coral reef system along the coast of northern Mozambique. The authors of the newly published study found that the unique conditions of the northern Mozambique Channel -- a confluence of tides, currents, eddies, along with less exposure to waves and storms -- seems to protect the channel's high coral richness. The research team asserts the corals of the Mozambique Channel should be a priority for conservation action. Credit: Emily Darling

Marine scientists keen on finding patterns of coral decline and persistence in gradually warming oceans have a complex challenge: how to save reefs containing the most diversity with limited resources. In the Western Indian Ocean, researchers from the Wildlife Conservation Society, the University of Warwick, the ARC Centre for Excellence of Coral Reef Studies, Simon Fraser University, University of North Carolina at Chapel Hill, and other groups have found that the corals of the Mozambique Channel should be a priority for protection as climate change continues to threaten these rainforests of the sea.

The study—generated from data gathered from nearly 300 marine sites over thousands of square miles of ocean—is the latest attempt by scientists to improve efforts to first identify reefs that have survived the effects of higher temperatures and sometimes human pressures such as fishing, and then actions best suited to protecting less disturbed coral ecosystems.

The study appears today in the online journal *PLOS ONE*. The authors are: Tim McClanahan and Nyawira Muthiga of the Wildlife Conservation Society; Mebrahtu Ateweberhan of the Wildlife Conservation Society and the University of Warwick, United Kingdom; Emily Darling of the Earth to Ocean Research Group at Simon Fraser University and the University of North Carolina at Chapel Hill; and Nicholas Graham of the ARC Centre of Excellence for Coral Reef Studies, James Cook University, Australia.

"Determining which reef systems possess a measure of resistance to climate change requires knowing how they have survived the many recent climatic disturbances" said Tim McClanahan, WCS's Senior Conservation Scientist and lead author of the paper. "The Western Indian Ocean provides us with a variety of responses to disturbances that we can examine and distinguish environmental variation, resilience, adaptation, and other factors for a more informed view of management

priorities and solutions to the climate crisis."

Working in 11 countries over a 7-year period, the research team surveyed a total of 291 coral reef sites to evaluate the variations in coral communities. Part of the study was to gauge the recovery of corals since 1998, the year of a massive warming event fuelled by the El Niño Southern Oscillation that caused massive bleaching in the region but also a series of lesser warming events that have disturbed the region since 1998.

The researchers worked in many sites along the African coastline as well islands such as the Maldives, the Seychelles, Comoros, Mauritius, Reunion, and others. The data collection efforts used two research methods for the study, the first being randomly placed 10-meter lines (known as line transects), where scientists identified the kinds of coral down to genus. The other method—known as a roving observer survey—involved the researcher identifying every coral within a randomly located 2-square-meter polygon. The scientists also recorded levels of observed bleaching during the surveys.

The main finding of the study, the authors note, is the unique conditions of the northern Mozambique Channel—a confluence of tides, currents, eddies, along with less exposure to waves and storms—that seem to protect the channel's high coral richness. High coral diversity and sensitive species have disappeared from many other sites sampled during the project.

Aside from the discovery of the Mozambique Channel as a conservation priority, the scientists found that the latitude where the reef systems are located determined the types of corals found. Northern coral reefs (closer to the equator) in coastal Kenya, Seychelles, and the Maldives—sites greatly impacted by the 1998 bleaching event—contained fewer temperature sensitive species (Acropora and

Montipora) and more corals resistant to warm water disturbances.

The scientists examined fishing closures or marine protected areas and found that these no-take areas may promote higher percentages of coral cover prior to a bleaching event, but seem to have no measurable effect on reef recovery after such an occurrence. This suggests the location of the protected areas is critical and they should be placed in areas where corals are surviving, such as Tanzania, Mozambique, and northern Madagascar.

"The remaining coral diversity of the Mozambique Channel presents us with an opportunity to safeguard these remaining ecosystems for posterity," said Dr. Caleb McClennen, Director of the WCS Marine Program.

Provided by Wildlife Conservation Society

Citation: Coral reefs of the Mozambique Channel a leading candidate for saving marine diversity (2014, April 10) retrieved 25 April 2024 from https://phys.org/news/2014-04-coral-reefs-mozambique-channel-candidate.html